

Notice of Allowability**Application No.**

09/912,114

Examiner

Susan McFadden

Applicant(s)

SHETTY ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Application filed 7-24-01.
2. ☒ The allowed claim(s) is/are 1-41.
3. ☒ The drawings filed on 24 July 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Bradley Forrest on August 31, 2004.

The application has been amended as follows:

In claim 1, line 1, "computer-implemented" has been added before "method". In claim 1, line 5, after input, --- data stream --- has been added.

In claim 2, lines 1 and 3, after input, --- data stream --- has been added. In claim 2, line 2, after input, --- data --- has been added.

In claim 3, lines 2 and 3, after input, --- data stream --- has been added.

In claim 4, line 1, after input, --- data stream --- has been added.

In claim 13, line 21, "storable" has been changed to --- stored ---.

REASONS FOR ALLOWANCE

2. The following is an examiner's statement of reasons for allowance: The prior art of record, Jaeger, "Discrete-time, discrete-valued observable operator models: A Tutorial", shows that an observable operator model is known in the art for identifying and predicting discrete-time, discrete-valued processes, both for output-only and input-output systems. Jaeger shows that the observable operator models may comprise a plurality of observable operators. In regard to claim 1, Jaeger do not specifically show a computer-implemented method of pattern

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recognition comprising: training a plurality of observable operator models for a plurality of characteristic events, receiving an unknown input data stream, computing a plurality of matching probabilities, one matching probability for each one of the plurality of characteristic events using the plurality of observable operators, wherein each matching probability is a probability that the unknown input matches a particular characteristic event; selecting a maximum matching probability from the plurality of matching probabilities; and displaying a characteristic event having the maximum matching probability. In regard to claim 7, Jaeger do not specifically show a computer-readable medium having computer-executable instructions for performing a method of recognizing speech, the method comprising: sampling a first input data stream, resulting in a plurality of samples, performing a spectral analysis of the samples to obtain a plurality of feature vectors; clustering the feature vectors to form a plurality of observation vectors; training at least one observable operator model using the observation vectors, and recognizing at least one part of speech from a second input stream using the at least one observable operator model. In regard to claims 13 and 23, Jaeger do not specifically show a data structure of an observable operator model used to recognize patterns or a computer readable medium, comprising: a plurality of characteristic events corresponding to a input stream, the input stream comprising a plurality of stream elements and the input stream comprising a plurality of sequences, an initial distribution vector, wherein each element of the initial distribution vector comprises a particular probability that a particular characteristic event is an initial event, the particular characteristic event

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being one of the plurality of characteristic events, a probability transition matrix, wherein each element of the probability transition matrix comprises an estimate of a particular probability of producing a particular characteristic event, after observing a particular sequence; an occurrence count matrix wherein each element of the occurrence count matrix comprises an estimate of a particular probability of producing the particular characteristic event, after observing a particular stream element followed by the particular sequence, and at least one observable operator calculable from the probability transition matrix and the occurrence count matrix, wherein the plurality of characteristic events, the initial distribution vector, the probability transition matrix, the occurrence count matrix, and the at least one observable operator are stored on a storage medium during a training phase and retrievable during a recognition phase.

In regard to claim 25, Jaeger do not specifically show a method for recognizing speech, comprising: sampling an input signal, converting the input signal to a discrete signal; storing the discrete signal in a buffer; reading a frame of data from the buffer; checking for silence or noise in the frame, removing any silence and noise from the frame; spectrally flattening a signal in the frame, performing frame windowing on the frame, computing a moving weighted average for the frame, performing feature extraction on the frame using a mathematical model, clustering the frame with previously read frames, training a plurality of observable operator models, recognizing at least one unknown word using the observable operator models, and displaying a recognized word corresponding to the at least one unknown word.


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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan McFadden whose telephone number is 703-308-6693. The examiner can normally be reached on Monday-Friday, 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 703-305-4827. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Susan McFadden
Primary Examiner
Art Unit 2655

August 31, 2004